VANCOMYCIN RESISTANT (INTERMEDIATE) STAPHYLOCOCCUS AUREUS (VRSA/VISA)

✓ DISEASE AND EPIDEMIOLOGY

Clinical Description:

Staphylococcus aureus (Staph aureus) can cause a variety of skin and soft tissue infections, as well as cause invasive disease including bacteremia, endocarditis, toxic shock syndrome, etc., Staphylococci produce a variety of extracellular pathogenic factors that are responsible for many of the disease manifestations including toxins (poisons), leukocidins (ability to destroy white blood cells) and hemolysins (the ability to destroy red blood cells) as well as the ability to produce biofilms and capsules (which help bacteria evade the immune system).

Causative Agent:

Staph aureus is a gram positive cocci (bacteria). VRSA (VISA) are bacteria that have acquired resistance (complete or intermediate resistance) to a glycopeptide antibiotic known as vancomycin.

NOTE: VRSA/VISA is NOT MRSA (methicillin resistant *Staphylococcus aureus*). There have only been 6 cases of VRSA and 16 cases of VISA reported in the U.S.

Differential Diagnosis:

Vancomycin and teicoplanin are glycopeptides antibiotics. If a Staph aureus is resistant to both of these antibiotics, it would be known as glycopeptides resistant/intermediate Staph aureus or GRSA/GISA.

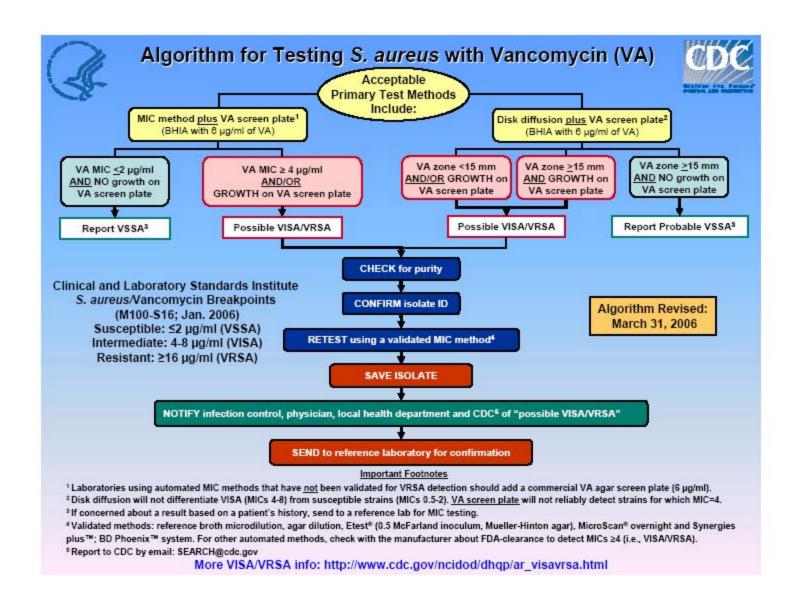
Laboratory identification:

The following algorithm demonstrates the appropriate laboratory identification schema. Additional information can be found at:

http://www.cdc.gov/ncidod/dhqp/ar visavrsa lab.html

It is important to recognize that automated testing methods commonly located in laboratories may not reliably detect this organism.

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Treatment:

To date, all cases of VISA and VRSA have been susceptible to other licensed antibiotics. There is concern however, about the possibility that an extremely-resistant bacteria could emerge from a case of VISA/VRSA, thus the cause for concern.

The decision to decolonize carriers should be made by the primary care physician in conjunction with hospital infection control and public health.

Case fatality:

If the organism is susceptible to licensed antibiotics, the case fatality should approximate that of non VRSA/VISA organisms. If the organism is resistant to licensed antibiotics, then the case fatality rate could rise.

Reservoir:

Staph aureus is found in mammals and birds and routinely colonizes skin and mucosal surfaces.

Transmission:

Staph aureus is transmitted from person to person by direct contact.

Susceptibility:

While all people are susceptible to Staph infections, individuals who have had long term antimicrobial therapy for multiply resistant organisms (especially vancomycin resistant enterococci) are at highest risk of developing this infection.

Incubation period:

Not applicable.

Period of communicability:

This is communicable until the patient has completed appropriate therapy.

Epidemiology:

At the time of this document, there have been 6 cases of VRSA and 16 cases of VISA identified in the United States. It is important to reinforce with hospitals, clinicians, and laboratories that identification of this organism is an important event with critical infection control elements that must be instituted. This infection, at this time, results from long term therapy with antibiotics (especially vancomycin).

✓ PUBLIC HEALTH CONTROL MEASURES

Public health responsibility:

- IMMEDIATELY NOTIFY UDOH AND HOSPITAL INFECTION CONTROL. VRSA is an infection control emergencies.
- Investigate all suspect cases of disease and fill out and submit appropriate disease investigation forms.

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- Provide education to the general public, clinicians, and first responders regarding disease transmission and prevention.
- Identify clusters or outbreaks of this disease.
- Identify sources of exposure and stop further transmission.

Prevention:

The likelihood of acquiring this disease is minimized by judicious use of antibiotics when treating individuals with severe infections, along with appropriate handwashing and other infection control measures.

Chemoprophylaxis:

The decision to decolonize healthcare workers should be made by occupational health services, the infection control team, the healthcare worker, public health, and the worker's personal physician.

The decision to decolonize non-healthcare worker contacts should be made by the contact, their primary care physician, and public health authorities.

Vaccine:

None

Isolation and quarantine requirements (VRSA only):

Isolation: Cases will be strictly isolated. See case investigation process. **Hospital:** Hospitals will institute strict infection control policies. See case investigation process. These are listed at:

http://www.cdc.gov/ncidod/dhqp/ar visavrsa prevention.html

Quarantine: Quarantine measures on colonized individuals are possible. See case investigation process.

✓ CASE INVESTIGATION

Reporting:

All isolates of Staph aureus with an MIC > 2 ug/ml from any sites are reportable.

Case definition:

VRSA/VISA (Utah 2007):

Clinical Description

Confirmed: Any clinical picture of infection, including skin and soft tissue infections, as well as invasive infections.

Suspect: A patient that is colonized but not infected.

Laboratory Criteria

Confirmed: For VRSA: an MIC ≥16 ug/ml. For VISA: an MIC between 4 and 8 ug/ml, with confirmation from the laboratory at the CDC.

Probable: The same MIC levels as identified by a reference laboratory.

Suspect: The same MIC levels as identified by a non-reference laboratory.

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Case Classification

The case classification will be the same as the laboratory criteria.

Case Investigation Process:

- Immediately notify UDOH and the ICP at the local hospital.
- The first step is to review the laboratory procedure and establish whether the results are valid. The steps of validation include the procedure in which the antibiotic susceptibility was performed and the procedure for verifying the identity of the organism. There must be sufficiently valid information that both the identification procedure and the susceptibility process were performed correctly before any further action is taken. This part of the investigation needs to be carried out in conjunction with a person who has knowledge of laboratory procedures and protocols.
- If the isolate has an MIC that is 8 ug/ml or lower, the case should be documented but no further actions need to be taken.
- If it is established that the laboratory procedure was acceptable and the MIC was 16 ug/ml or higher, then UDOH should notify the CDC immediately.
- The local health department should work with the infection control practitioner to assure adequate infection control measures are being taken.
- A conference call between UDOH, the LHD, the infection control practitioner, the infectious disease physician assigned to the case, and CDC (if they choose to participate) will occur.
- The following is an example of items that may occur if a VRSA is identified:
 - Obevelop a written plan to determine infection control actions that will be taken with all individuals who are identified as carriers. This plan must include treatment protocols, followup cultures (how and when obtained), when carriers will be considered free of colonization, and quarantine protocols for carriers. This plan should be written and agreed upon prior to any culture workups of contacts.
 - All contacts should be identified and categorized as extensive, moderate, or minimal, according to their level of interaction with the colonized or infected patient.
 - As a first step, identify all contacts with extensive interaction with the patient based upon a defined period before the first culture date. Examples of extensive interaction would involve:
 - Patients who shared a room with the case patient.
 - Healthcare providers and staff who:
 - o Clean/bathe/rotate/ambulate the patient
 - Change dressings
 - o Make more than 3 visits per day to the patient
 - o Handle secretions and body fluids (including respiratory secretions)
 - o Care for wound dressings or perform debridement
 - o Conduct physical exams on the patient
 - Have documented prolonged patient contact, including physical therapy, rehabilitation personnel, dialysis, and respiratory technicians
 - Family members who:
 - o Provide primary care

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- Have close contact with patient (e.g., sleep in the same bed, or same room)
- Examples of <u>moderate</u> interaction include:
 - Healthcare providers and staff who:
 - Deliver medications
 - Cross-cover patient only
 - o See the patient on daily rounds, without conducting extensive exams
 - Perform surgical or invasive procedures where sterile barriers or aseptic techniques are used.
 - o Monitory patient-care equipment without handling secretions
 - o Have limited interactions (e.g. radiology technicians)
- Examples of <u>minimal</u> interaction include:
 - Healthcare providers and staff who:
 - o Work on the same floor without formal cross-coverage of patient
 - o Perform predominately administrative duties
 - o Consult without extensive exam
 - Visit during teaching rounds only
 - Provide dietary or maintenance services that do not interact directly with the patient
- Collect surveillance cultures
 - Patient:
 - Culture nares, wounds, drains, and other clinically relevant sites.
 - Consider determining whether patient also carries VRE.
 - Healthcare providers and staff with extensive interaction:
 - Culture nares and all skin lesions/wounds.
 - If no one in this group is identified as colonized with VRSA/VISA, then do not continue with surveillance cultures for individuals with moderate or minimal interaction.
- If VISA/VRSA colonization of contacts is identified OR until the case is no longer colonized or infected:
 - Culture the nares of contacts with extensive interaction (weekly) to assess the efficacy of infection control precautions.
 - Place a log book at the entrance of the patient's room to identify and track patient contacts.

Outbreaks:

An outbreak will be defined as:a single case of VRSA in Utah.

Identification of case contacts:

See above.

Case contact management:

See above.



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Principles and Practice of Infectious Disease (6th Edition), Gerald L. Mandell, John E. Bennett, and Raphael Dolin Eds; 2005.

Guidelines for Environmental Infection Control in Health-Care Facilities and Recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC)

Hageman JC, Patel JB, Carey RC, Tenover FC, and Mcdonald LC. Investigation and Control of Vancomycin-Intermediate and –Resistant *Staphylococcus aureus*: A Guide for Health Departments and Infection Control Personnel, Atlanta GA, 2006. http://www.cdc.gov/ncidod/dhqp/pdf/ar/visa_vrsa_guide.pdf

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